

## SEPARATION DEVICE

### Claims

1. Separation device (1) for the separation of constituents (2, 3, 4, 5) of different density, in particular of a fluid fed from a well hole (6), with a container (7) in which the fluid at least partially after entry via at least one feed line (8) is separated into its constituents (2, 3, 4, 5) using centrifugal force in the radial direction (12) and / or using gravitational force in the vertical direction,  
**characterised in that,**  
a classifier device (11) is arranged in a lower section (9) of the container interior (10), which at least exhibits one discharge line (13), extending in the radial direction (12) outwards, for the discharge of the fluid into the container interior (10) and delivery lines (14, 15, 16), joined to the container interior (10) at different levels in the vertical direction (17), for the separated fluid constituents (2, 3, 4, 5).
2. Separation device according to Claim 1,  
**characterised in that**  
the discharge line (13) is formed at least adjacent to its discharge opening (18) in an approximate spiral shape.
3. Separation device according to Claim 1 or 2,  
**characterised in that**  
the discharge line (13) extends from a vertical pipe (19) of the classifier device (11), the said vertical pipe being arranged essentially centrally in the container (7).
4. Separation device according to one of the previous claims,  
**characterised in that**  
within the vertical pipe (19) a fluid line (20) terminates from which the fluid enters the discharge line (13) via the pipe interior (21).

5. Separation device according to one of the previous claims,  
**characterised in that**  
the vertical pipe (19) is subdivided in the longitudinal direction (22) into a number of pipe sections (23, 24, 25, 26), separated from one another, whereby the fluid feed line (20) terminates in a first lower pipe section (23) and the delivery lines (14, 15, 16) are arranged with their entry ends (27, 28, 29) in each case in further pipe sections (24, 25, 26) above the first pipe section (23).
6. Separation device according to one of the previous claims,  
**characterised in that**  
entry openings (30) are formed in the pipe casing (31) of the vertical pipe (19) at least in the region of the further pipe sections (24, 25, 26).
7. Separation device according to one of the previous claims,  
**characterised in that**  
a length (32) of the pipe sections (23, 24, 25, 26) is variable.
8. Separation device according to one of the previous claims,  
**characterised in that**  
the pipe sections (23, 24, 25, 26) are separated by intervening bottoms (33).
9. Separation device according to one of the previous claims,  
**characterised in that**  
two discharge lines (13, 34), essentially coil shaped radially outwards and running vertically upwards, extend from the vertical pipe (19).
10. Separation device according to one of the previous claims,  
**characterised in that**  
the discharge line (13, 34) exhibits a number of openings, in particular on its outer side, essentially in the radial direction.

11. Separation device according to one of the previous claims,  
**characterised in that**  
the classifier device (11) exhibits at least one blade segment (37) protruding radially outwards from the vertical pipe (9).
12. Separation device according to one of the previous claims,  
**characterised in that**  
the blade segment (37) exhibits openings (38) for the accommodation and / or mounting of the discharge line (13, 34).
13. Separation device according to one of the previous claims,  
**characterised in that**  
the openings (38) are arranged along a radial outer end section (39) of the blade segment (37).
14. Separation device according to one of the previous claims,  
**characterised in that**  
the openings (38) are formed as a partially open edge recess (40) of the blade segment (37).
15. Separation device according to one of the previous claims,  
**characterised in that**  
the container (7) exhibits a bottom plate (35) enclosing the vertical pipe (19) with outlet openings (36) for at least the fluid constituent (2) with the greatest density.
16. Separation device according to one of the previous claims,  
**characterised in that**  
the delivery lines (14, 15, 16) within the vertical pipe (19) exhibit essentially vertically running line sections (41) which are connected to at least one rotary slide valve (42).
17. Separation device according to one of the previous claims,

**characterised in that**

the line sections (41), following the rotary slide valve (42) and using a multibore connector (43), in particular electrical, can be connected to transport lines (44, 45, 46, 47) for the further transport of the fluid constituents.

18. Separation device according to one of the previous claims,

**characterised in that**

the fluid feed line (20) is connected via the rotary slide valve (42) and electrical multibore connector (43) to a fluid well-hole line (48) which feeds the fluid from the well hole (6).

19. Separation device according to one of the previous claims,

**characterised in that**

a flow control valve (49), in particular electrical, is arranged in the transport line (44, 45, 46, 47).

20. Separation device according to one of the previous claims,

**characterised in that**

a throttle device (50) and / or a metering valve (51) follows the flow control valve (49).

21. Separation device according to one of the previous claims,

**characterised in that**

at least one level sensor is assigned to each pipe section (23, 24, 25 26).

22. Separation device according to one of the previous claims,

**characterised in that**

at least one sensor device (52) is assigned to an upper end (53) of the container interior (10) and / or pipe interior (21).

23. Separation device according to one of the previous claims,

**characterised in that**

at least one feedback line (54) is provided between the separation device (1) and the well hole (6).

24. Separation device according to one of the previous claims,  
**characterised in that**  
the separation device (1) is arranged to be replaceable as part of a so-called tree (55) on the sea bed.
25. Separation device according to at least one of the previous claims,  
**characterised in that**  
the separation device (1) exhibits a frame structure (56) for mounting at least the container (7), lines (20, 44, 45, 46, 47, 48), pumps, valves, throttles or similar equipment.
26. Separation device according to one of the previous claims,  
**characterised in that**  
the separation device (1) is connected to an electrical supply and control unit (58), particularly positioned locally.
27. Separation device according to one of the previous claims,  
**characterised in that**  
at least one changeover valve (59), in particular electrical, is arranged in the fluid well-hole line (48).
28. Separation device according to one of the previous claims,  
**characterised in that**  
a bypass pipeline (60) branches from the fluid well-hole line (48).
29. Separation device according to one of the previous claims,  
**characterised in that**  
the container (7) is essentially spherical or silo-shaped.

30. Separation device according to one of the previous claims,  
**characterised in that**  
at least the container (7) is of modular construction.